Product Overview

AM62P - Arm® Cortex®- A53 Microprocessor

AM62P Processor Overview

The AM62P is a low-power, high-performance system-on-chip (SoC) designed for human-machine interaction. Designed for a broad range of applications including industrial HMI, patient monitoring, EV charging, and many others, the AM62P accelerates development while providing efficient power consumption. With up to four ARM Cortex-A53 cores and two ARM Cortex-R5F cores, the AM62P provides robust computing and edge AI capabilities. The AM62P supports up to three HD-displays with a dedicated 3D GPU and video codec.

Target Applications and Key Markets

- *Industrial Automation*: Factory automation, robotics, industrial communication, industrial HMI, retail automation and payment
- *Automotive*: in-vehicle infotainment (IVI), digital instrument clusters, body electronics
- *Building Automation*: Smart home devices, Lighting Control Systems, HVAC controllers
- *Medical*: Patient monitoring
- *Grid Infrastructure*: EV charging and Grid Monitoring

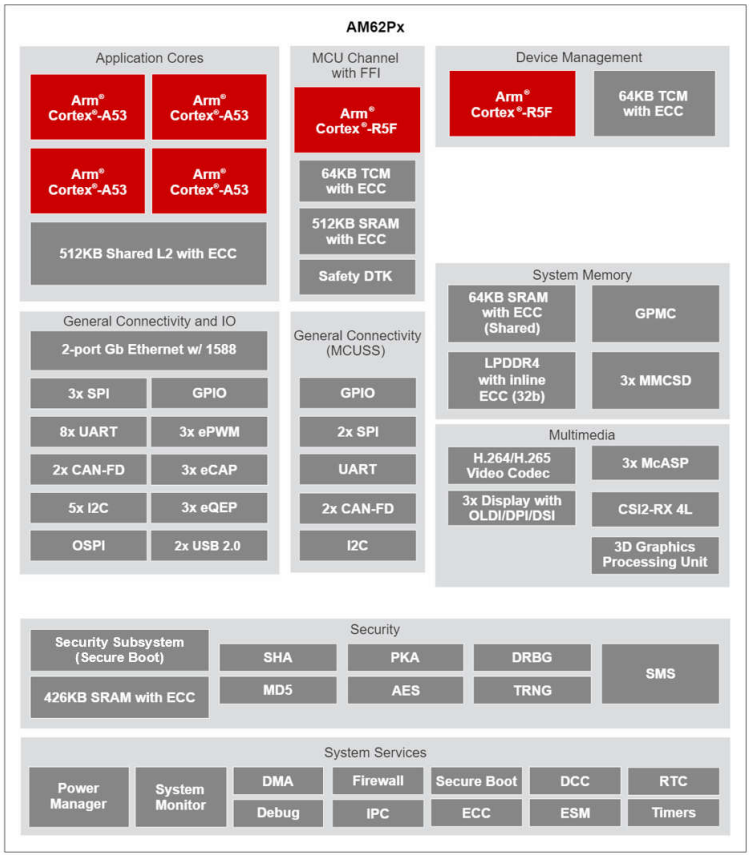


Figure 1. Functional Block Diagram

Key Features

- *CPU*: Quad-core ARM Cortex-A53, up to 1.4GHz
- *Memory*: Supports 32-bit LPDDR4 and DDR4
- *Graphics*: Integrated GPU supporting 3D graphics, up to 50 GFLOPS
- *Real-time Processing*: ARM Cortex-R5F for real-time control, up to 800MHz
- *Connectivity*: Dual Gigabit Ethernet w/TSN, 2x USB 2.0, 3x CAN-FD
- *Display*: 3x HD Displays, OLDI (LVDS), MIPI DSI, DPI
- *Video*: Up to 4K UHD resolution video codec
- *Security*: Secure enclave, secure boot, hardware encryption, ARM Trustzone, and OP-TEE
- *Operating Systems*: Linux, Android, RTOS (R5 only)
- *Power Consumption*: Typical power consumption 3-4W depending on configuration and temperature for industrial and automotive applications
- *Power Management Design*: TPS65224-Q1 PMIC

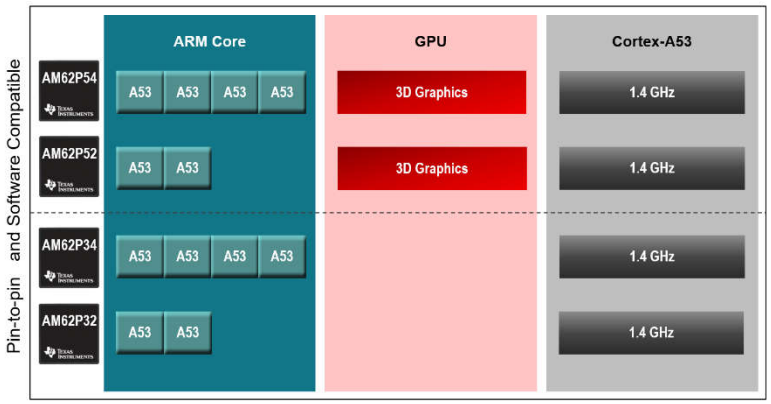


Figure 2. Device Configuration

Software

The AM62P is capable of supporting high-level operating systems, including both Linux and Android. There are Processor Software Development Kits (SDKs) created for both, each with real-time functional safety and security functionality. The SDKs are licensing and royalty free, feature-rich, and allow you to easily begin your software development on the AM62P with integrated demonstrations and examples. The SDKs also have long-term stable (LTS) kernel support on the ARM Cortex-A53 cores and MCU+ SDK support, including FreeRTOS, for the ARM Cortex-R5F core. For development help and support, look to TI's Developer Zone.

Scalability

The AM62P processors offer scalable performance and feature sets to cater to a wide range of application needs. All AM62P devices are pin-to-pin compatible, allowing developers to select the appropriate model for their current system and to easily adapt as their requirements change. There is a unified software platform for the entire AM6x family including the AM62P. This simplifies the development process by providing a unified platform for software development, reducing time and effort spent on software integration and testing when using different processors. The scalable software maintains that developers can use the AM62P across different projects, including when moving from the simpler AM625 or the more complex AM67, while reducing development time and costs.

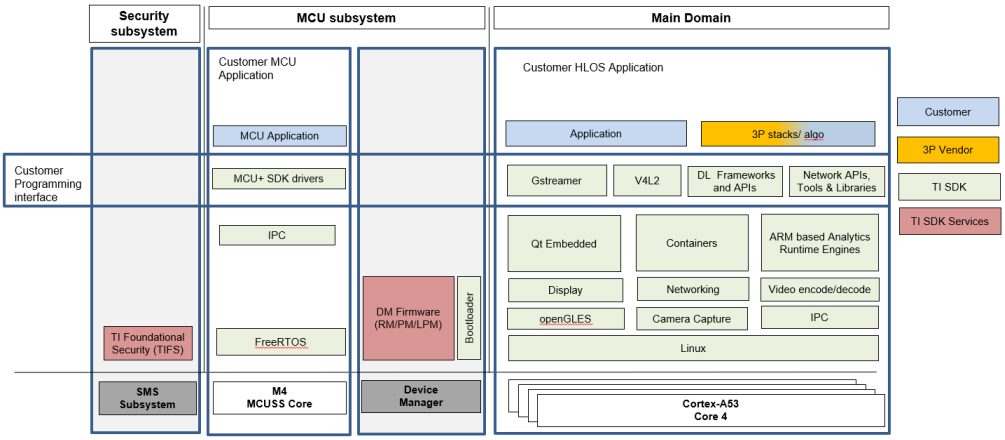
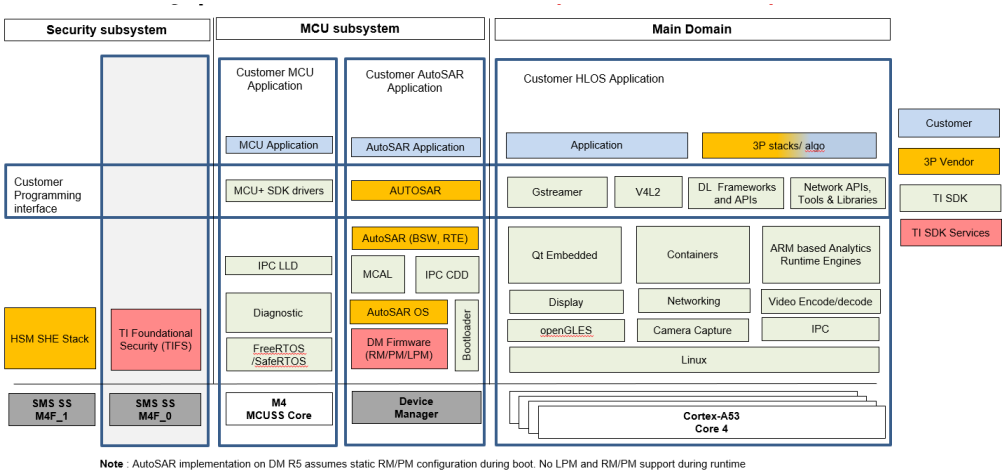


Figure 3. Industrial Software Architecture



Note : AutoSAR implementation on DM R5 assumes static RM/PM configuration during boot. No LPM and RM/PM support during runtime

Figure 4. Automotive Software Architecture

Multimedia and Graphics

The AM62P supports three full-HD displays over OLDI (LVDS), MIPI DSI, and DPI. The AM62P has four display pipelines with a maximum of two display pipelines per display. The AM62P also has a 3D GPU that supports up to 50 GFLOPS for high definition graphics. Other peripherals, including a CSI-2 receiver and a video codec, allow you to easily display what your system needs, from a camera feed to video streaming. The AM62P supports video and high definition 3D graphics on triple displays, making the AM62P a great fit for your system.

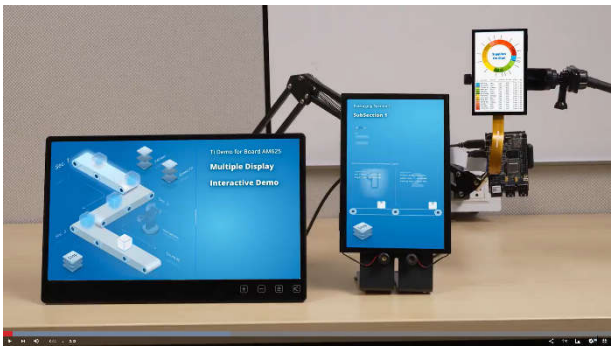


Figure 5. Smart HMI Processors

Demos

There are several demos to showcase the AM62Ps various applications. As shown in the above photo, the AM62P supports up to three full-HD displays simultaneously. In this demo, the AM62P is being used in an industrial application at a packaged goods factory. Other demos display the AM62Ps facial recognition, connectivity, and HMI capabilities for a variety of applications including industrial, home automation, automotive, and EV charging.

Security

The AM62P has several security features to support device protection and help meet new security regulations. AM62P includes a secure enclave to isolate the security functions from the rest of the device, securely enabling features like secure boot with hardware-enforced Root-of-Trust. AM62P has extensive firewall support and a dedicated security DMA and Inter-Processor Communication (IPC) for isolation and secure storage support, as well as cryptographic acceleration. The security subsystem includes an HSM core for HSM stack integration. AM62P employs ARMs Trustzone technology to provide a Trusted Execution Environment (TEE) through OP-TEE. AM62P is security-centric to enable you to protect your device, system, and data.

Evaluation Module

The AM62Ps starter kit Evaluation Module (EVM) is the SK-AM62P-LP. The SK-AM62P-LP is a great fit for those looking to develop automotive and industrial applications. The SK-AM62P-LP allows you to use and test the AM62P and explore the broad range of peripherals before developing your design. The SK-AM62P-LP has multiple display connectors for three displays, a CSI-2x camera connector, Wi-Fi® and Bluetooth® capabilities, 2x Ethernet ports, temperature sensors, and UART connections. The SK-AM62P-LP also has a software development kit (SDK) to start you Linux and Android development.

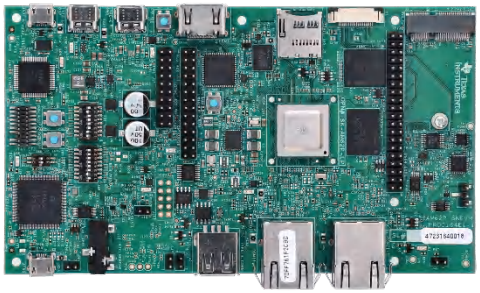


Figure 6. AM62PEVM

Third Party Ecosystem Partners

TI has partnered with several software and hardware vendors to create the TI Processors ecosystem for the AM6x portfolio. The AM62P Development Platform for HMI supports and speeds your development process. Start your HMI development with our ecosystem partners today.

Commonly Asked Questions

1. *What operating systems are supported by the AM62P processor?* The AM62P processor supports multiple operating systems, including Linux, Android and RTOS (R5F only).
2. *How do I power the AM62P?* We have created a Power Management IC (PMIC), orderable part number TPS6522430RAHRQ1, to power applications using the AM62P processors. Learn more.
3. *What is the difference between the AM625 and AM62P?* The AM62P is the high-performance version of our AM62 processors. The AM62P is designed for graphics with a 32-bit DDR subsystem, video codec, and three displays.
4. *If I start my design with the AM625 can I move to the AM62P? How about the AM67?* Yes, the AM625, AM62P, and AM67 are software compatible. You can start your software development on the AM625 or AM67 and easily move to the AM62P!

5. *How does the AM62P maintain data security?* The AM62P includes advanced security features such as secure boot, hardware encryption, and support for secure software updates, maintaining that data is protected from unauthorized access and tampering.
6. *What development tools are available for the AM62P?* TI provides SYSCFG tools for PinMux , peripheral/ driver configuration (R5/M4), clock tree visualization and memory configuration, and more, DDR Register Configuration Tool. These tools help streamline the development process and reduce time-to-market. Visit TI developer zone for all the software, tools and training academies for the device family
7. *How to get started with AM62P Academy?* You can first visit theAM62P Academy . Here, you can find a variety of training modules, tutorials, and resources that guide you through setting up and developing Linux SDK, MCU+ SDK and multi-core aspects of the AM62P processor. These resources are designed to help both beginners and experienced developers efficiently leverage the capabilities of the AM62P.
8. *How to get demos?* Visit the TI Resource Explorer (Tirex), which provides a wide range of demos, code examples, and application notes that showcase the processor's capabilities in various use cases. The Design Gallery contains further demos to show the AM62Ps capabilities.

Development Tools and Resources

- AM62P Product Folder: AM62P product details, technical documentation, and additional information.
- AM62P Starter Kit: Evaluation module built around the AM62P to streamline intuitive software design.
- AM62P SDK: Software development kit for easy setup and fast out-of-box access to benchmarks and demonstrations.
- SysConfig: Configuration tool designed to simplify hardware and software challenges.
- Pinmux: SysConfig file to aid in configuring pins.
- AM62P IBIS Model: IBIS simulation model
- AM62P AMI Model: IBIS-AMI simulation model
- AM62P BSDL Model: BSDL simulation model
- AM62P Thermal Model: Thermal simulation model
- AM62Px Academy: Guides and trainings designed to simplify and accelerate development.
- TI Linux Academy: Comprehensive training and resources for developing Linux-based applications.
- Multicore Academy: Guides and best practices for implementing multicore systems.
- TI Developer Zone: Tools, software, and training to easily develop code.
- E2E Forums: Get technical support from our engineers.
- AM62x Design Gallery: Analytics, HMI, and connectivity designs to showcase the capabilities of the AM62x processors.
- TI Resource Explorer (Tirex): Access to demos, code examples, and documentation.
- TI Partner Directory: Discover our partners, offering specialized products and services to help you get to market faster.

Learn more about our other related processors:

- AM625SIP (System in Package)
- AM623 and AM625
- AM62A (Analytics)

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